The National Cross-Site Evaluation of High-Risk Youth Programs

Understanding Risk, Protection, and Substance Use Among High-Risk Youth

Monograph Series No. 2

Points of Prevention

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
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Foreword

The Center for Substance Abuse Prevention (CSAP) in the Substance Abuse and Mental Health Services Administration (SAMHSA) is the Nation's lead agency for substance abuse prevention. The Center funds community-based organizations, universities, behavioral health providers, and public agencies to identify effective prevention programs and practices and disseminates findings, program models, and other prevention materials to practitioners and policymakers across the country. This document summarizes the findings of CSAP's National Cross-Site Evaluation of High-Risk Youth Programs. This large multiple-site evaluation was designed to assess 48 prevention programs and to identify those program characteristics that are associated with strong substance abuse prevention outcomes.

The National High-Risk Youth Demonstration (funded from 1987 to 1995) has been one of the most ambitious and productive of CSAP's funding initiatives. In its early years, the demonstration focused on identifying promising approaches to prevention. As the demonstration matured, individual site and cross-site research produced knowledge about risk and protective factors related to substance use and helped to identify model programs for effective prevention. Research and experience in the High-Risk Youth Demonstration also contributed to the awareness of the importance of culturally sensitive, age-appropriate and gender-specific programming. This progress in prevention theory and practice laid the foundation for the research reported in this document, the largest and most comprehensive of CSAP's High-Risk Youth studies.

In addition to individual-level information on substance use, risk, and protection, the evaluation includes detailed information on the nature and amount of prevention services in which each child participated, as well as systematic process information on the study programs. This monograph highlights the study's contributions to the growing evidence that "Prevention Works." The monograph also highlights the study's contributions to the understanding of how substance use develops in youth at high risk, and the risk and protective factors that contribute to or protect against substance use. More specifically, this document summarizes major findings concerning changes in substance use, risk, and protection as youth mature through adolescence, summarizes findings concerning the pathways between external and internal risk and protective factors and substance use during adolescence, and identifies implications for policies and programs designed to prevent substance use.

This document is part of a series of Points of Prevention publications that document the contribution of CSAP's National Cross-Site Evaluation of High-Risk Youth Programs to prevention knowledge and provide science-based guidance for improved prevention policy and practice.

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Introduction

Substance use is increasingly recognized as one of the Nation's most pervasive, costly, and challenging health and social problems. The use, and particularly the early use, of tobacco, alcohol, marijuana, and other illicit drugs is intricately entwined with serious personal and social problems, including school failure, crime, family violence and abuse, and a host of additional social and personal problems that constitute a continuing national tragedy. For over a decade, the Center for Substance Abuse Prevention (CSAP) within the Substance Abuse and Mental Health Services Administration (SAMHSA) has been the Federal agency charged with providing leadership in preventing the profound negative consequences of substance use. Important components of this leadership responsibility include design and funding of demonstration substance use prevention programs, followed by evaluation of those programs to identify prevention services that work in real community settings.

The prevention concept is simple. It postulates that changing the social and personal conditions that promote and support substance use will benefit society and individuals more than trying to treat the physical and psychological results of use or control its social consequences. Implementing the prevention concept, however, is complex. A growing body of research has documented a "web of influence" through which circumstances of community, family, school, and peer group condition youths' risk for substance use (CSAP, 1999).

Despite the complexity of implementing the prevention concept, CSAP has made great progress in generating new knowledge about the design, implementation, and effectiveness of prevention strategies and activities. Most recently, CSAP launched a large, multisite study of substance abuse prevention programs for high-risk youth. That study—called the National Cross-Site Evaluation of High-Risk Youth Programs—collected data on substance use and conditions thought to be associated with it from a diverse sample of youth. The science-based knowledge emerging from this study is strengthening our understanding of conditions that can influence substance use patterns among high-risk youth. These risk and protective factors, as they are called, include both internal (individual) and external (environmental) influences. Results of the Cross-Site Evaluation are boosting our understanding of the complex relationships among these factors and aiding future prevention planning.

The science-based knowledge emerging from this study is strengthening our understanding of conditions that can influence substance use patterns among high-risk youth.

This monograph addresses a topic that is important to both prevention practitioners and researchers. While the risk and protection framework heavily influences the work of both professional groups, the interrelationships among risk and protective factors have not been well understood. Previous efforts to model how risk and protection factors relate to substance use have been based on data from the general youth population, often using relatively small samples. The data collected by the CSAP National Cross-Site Evaluation of High-Risk Youth Programs provide an excellent opportunity to investigate these interrelationships and, through modeling, to advance our understanding of how certain risk and protective factors influence the behaviors of at-risk youth. The Cross-Site sample reflects a diversity of youth from many population subgroups. A robust model of risk, protection, and substance use can show practitioners which factors to target and suggest appropriate intervention strategies. Researchers can use such a model to identify critical variables, guide measurement selection decisions, and focus data analysis plans.

More specifically, this monograph contributes to understanding how prevention can strengthen conditions that help youth at risk avoid substance use by presenting evidence, findings, and recommendations in the following areas:

- Risk and protective factors have been categorized and conceptualized in different ways. This monograph follows CSAP's "web of influence" (CSAP, 1999) categorization of factors into environmental factors "external" to youth and individual factors "internal" to youth. The external and internal distinction is presented as particularly useful because prevention programs and strategies for addressing each category tend to be distinct.
- Differences in levels of risk and protection for internal and external factors are identified by age, demonstrating the dramatic increases in risk experienced in some areas as youth move from pre-adolescence into the teen years.
- The degree to which different risk and protective factors are associated with substance use is examined, suggesting the relative importance of specific internal and external factors as contributors to, reinforcers of, or protections against substance use.
- Finally, structural modeling is used to represent plausible pathways among external risk and protection, internal risk and protection, and substance use among youth in high-risk circumstances.

Summary of Major Findings

Major findings presented in this monograph include the following:

- As youth age, levels of risk and protection shift considerably. The findings on risk, protection and substance use and the age of youth reveal a consistent pattern. As youth move through the adolescent years there is a steady movement from the protective to the risk conditions in most of the external and internal factors. That movement is particularly great in family bonding, school bonding, and peer attitudes—those factors that refer to the social environments to which youth are building attachments as they mature.
- Gender plays an important role in risk, protection, and substance use. The data suggest that conditions in the neighborhood have a greater influence on substance use in males than in females, while the relationships among all the internal risk and protection factors and substance use are substantially stronger for females than for males.
- Connectedness protects against substance use. Positive behavioral outcomes among youth reflect a tight interweaving of external and internal protective factors. Connectedness to family and school forms the core of this protection. Meaningful involvement is key to connectedness. When the external environments of family and school offer youth involvement that is challenging, provides recognition, and is rewarding, these environments serve as powerful protective factors against substance use.
- The peer environment is critically linked to substance use. Youth whose peers do not use substances tend not to use substances themselves. Youth whose peers disapprove of substance use also report less use of substances. Because peer relationships are strongly associated with the family, school, and community environments in which youth reside, positive changes in those external environments can affect the peer environment and impact individual substance use.
- Broadening the range of protective influences in the external environments increases protection against substance use. Efforts to strengthen families (by encouraging communication, appropriate supervision, and positive norm setting) and to strengthen schools as caring communities (to improve school bonding) increase the protection of youth against substance use.

The National Cross-Site Evaluation of High-Risk Youth Programs

The National Cross-Site Evaluation of High-Risk Youth (HRY) Programs is a 5-year study that CSAP began in 1995 (Sambrano, Springer, and Hermann, 1997). Forty-eight HRY demonstration programs across the Nation participated in the study.[1] These grantees were funded by CSAP to implement and assess programs to prevent and reduce the use of alcohol and illicit drugs among at-risk youth. A rigorous research design incorporating lessons from earlier evaluations of prevention service implementation and effectiveness guided the study. The evaluation used a quasi-experimental comparison group design to study the more than 6,000 youth who were participating in the 48 demonstration programs, comparing them with more than 4,500 similar youth in the same communities who were not participating in the programs.

The study has several unique features, including:

- The use of a common questionnaire (the CSAP National Youth Survey) in all sites.
- Data collection at four points in time: program entry (baseline), program completion (exit), 6 months after program completion, and 18 months following program completion.
- A viable comparison group at each participating site.
- Complete documentation of the amount and type of program contact for each participant (dosage data).
- Detailed information on program implementation and prevention strategies at each site.

The study design allowed CSAP to test the effectiveness of programs by measuring changes in participants' risk, protection, and substance use over time and comparing the results to changes in similar youth who did not receive program services.[2]

Relevance of the Cross-Site Study to Prevention Practitioners

Prevention staff, teachers, counselors, and other youth workers look for "blueprints" of effective practice to help guide their efforts to promote positive youth development. They also implicitly understand that no one blueprint will fit all youth. Youth workers in communities know what prevention research has increasingly documented—that effective ways of reaching and impacting youth must consider their uniqueness, their stage of growth and experience, their gender, and their cultural circumstances.

Effective program strategy must involve messages and activities that are meaningful to the particular circumstances of youth.

Effective program strategy must involve messages and activities that are meaningful to the particular circumstances of youth. The maturation process, which is rapid in the earlier years of life, provides clear examples. Prevention objectives that are appropriate for teenagers at a stage when tobacco and alcohol experimentation is widespread are not appropriate for 9-year-old children. As youth take steps toward the independence that is necessary for autonomy in adulthood, the protective and supervisory role of family evolves as well. Young men's and young women's risk and protection influences differ, pointing to the need for differing gender-based strategies. What faces the prevention field at this stage in its development is a "sorting out" process—one of identifying from among the many prevention objectives and strategies those approaches that prove most effective for youth at risk.

Prevention professionals can use the information generated by CSAP's study to improve their aim at this moving target of approaches. This diverse high-risk study sample provides an excellent proving ground for identifying connective paths among risk and protection factors and substance use. It also provides a basis from which to assess the appropriateness of specific prevention objectives and practices in a variety of settings.

[1] CSAP funded 94 programs in 1994 and 1995. Programs were not included in the Cross-Site Evaluation if they served children primarily under the age of 9. Approximately half of the 48 programs that participated in the Cross-Site study were funded in 1994 for 5 years and the other half were funded in 1995 for 3 years. These program were located throughout 22 States, including Alaska and Hawaii.

[2] Findings on program effectiveness are reported in other monographs published in the CSAP Points of Prevention Series.

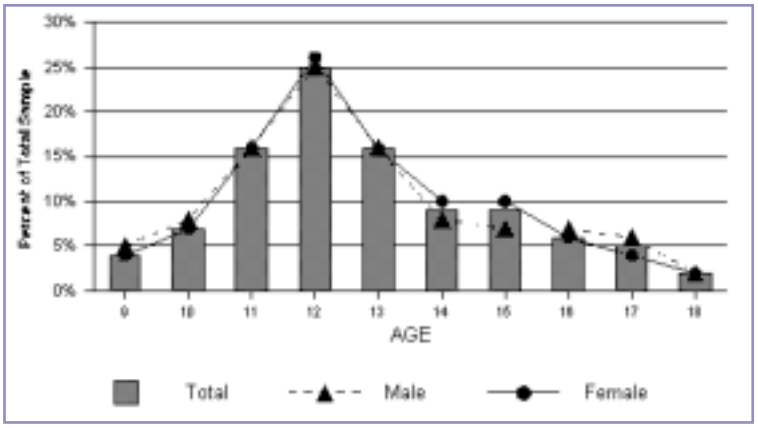
This report cites findings using data from both program participants and comparison group youth because its objective is to convey the importance of differences in youth risk and protection characteristics as they relate to substance use. Typically, baseline data were collected within a few weeks before or after participating youth began receiving services, and at the same time for comparison group youth. The information that follows on study sample diversity, patterns of risk and protection by age, and patterns of substance use by age and gender draws on these baseline data.

This diverse high-risk study sample provides an excellent proving ground for identifying connective paths among risk and protection factors and substance use.

Characteristics of Sample Youth

The age at which to target youth for preventive interventions has been a topic of discussion and debate among prevention practitioners and researchers. Prevention or early intervention programs have been developed for all full age ranges of youth. These encompass preschool programs aimed at enhancing children's development and addressing negative behaviors, as well as programs aimed at college binge-drinking and at safely negotiating life's major transitions. Youth selected for inclusion in CSAP's National Cross-Site Evaluation were limited to those between the ages of 9 and 18. Within that broad age range, from preadolescence through the late teens, the target focus of each program determined the age of the youth it served. Figure 1 displays age and gender information for youth (both program participants and comparison group youth) in the study sample.

Figure 1
Distribution of Sample by Age and Gender
(N = 10,473)



More than half (57%) of the youth in the study were between 11 and 13 years of age when they entered the study, reflecting the fact that the prevention programs in this study recruited and served predominantly children of middle school age. This concentration of effort in the middle school years reflects a planned response to the perception that middle school youth are at a transition point that puts them at particular risk for starting to use substances. It also reflects the fact that middle school youth are still relatively accessible for organized programming because they do not yet drive, hold part-time jobs, or have the freedom of movement of the later teen years. Whatever the reasons, it is clear that the HRY prevention programs funded by CSAP in the mid-1990's often targeted preteens.

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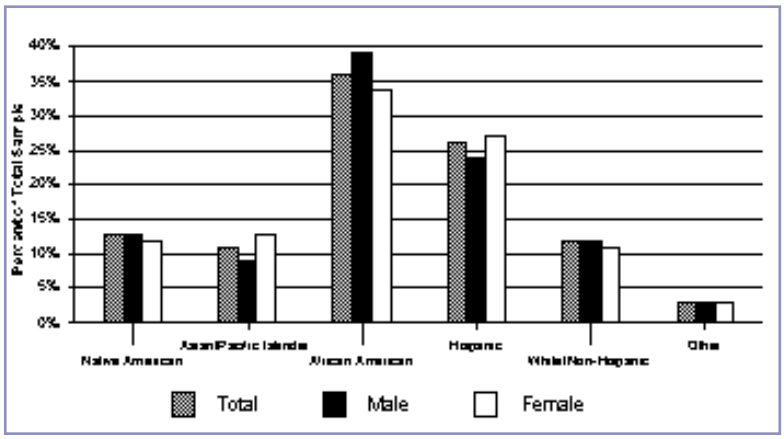
Because 19 (40%) of the programs included in the study targeted female adolescents, there are many more females (66%) than males (34%) in the total sample. The gender-specific age profiles within Figure 1 indicate that, in this sample, the females are somewhat older than the males (mean female age = 12.84; male = 12.76), with a higher percentage of females in the 14- to 17-year-old age groups.

Many of the HRY prevention programs were community-based, focusing on particular community populations. Figure 2 indicates that these programs served a diversity of racial/ethnic groups. More than 33 percent of the youth were African American and around 25 percent were Hispanic. Of the remaining youth, approximately 10 percent were Native American, 10 percent were Asian/Pacific Islander, and 10 percent were White/non-Hispanic. There is cultural and/or regional diversity within the racial/ethnic groups as well (e.g., programs targeting youth in recent-immigrant communities).

Some programs used recruitment procedures that targeted special populations, adding diversity to the youth sample. Most programs recruited youth from high-risk settings: schools, neighborhoods, housing developments, or youth organizations. As an alternative, several programs based participant selection on a common individual behavioral or personal attribute. Specifically, two programs served youth who had been placed in a secure facility by court order; two programs targeted youth with disabilities (physical and developmental/emotional); one program focused on young women with histories of sexual abuse; and one program focused on youth in the foster care system.

Figure 2
Distribution of Sample by Race and Gender
(N = 10,473)



Implications of Sample Characteristics

Characteristics of the study sample influence the contribution the Cross-Site Evaluation can make to prevention knowledge and have implications for the ways in which the study data must be analyzed. Because youth in the study were not selected systematically from the entire population of youth at risk, their behaviors and outcomes cannot be assumed to represent those of the full at-risk youth population. On the other hand, sample youth are drawn from a generally representative set of community-based programs serving the full spectrum of at-risk youth. In that sense, the diversity of the youth in the sample strengthens the study's ability to identify general characteristics of at-risk youth. It also provides a setting for testing the generalizability of connections between risk and protective factors and substance use in youth at risk.

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High-Risk Youth and the "Web of Influence"

Over the past decade, research and practice in prevention have produced a dominant approach to thinking about how to prevent substance use and associated problems among youth. A large body of research informs this approach. It proposes that substance use and other problems are part of a consistent pattern of circumstances that tend to occur together. Community and neighborhood environment, school conditions and performance, family environment, and particularly, peer attitudes and behaviors all contribute to substance use. This literature also established that early behaviors are highly predictive of the development of problem behaviors as youth mature.

Articulation of the role of risk factors in the initiation and growth of substance use among youth had important implications for prevention programming. Early prevention efforts were often based on the assumption that young people used substances largely because they were not informed of their health, legal, and social dangers. Programs based on this assumption were limited in content and disappointing in result. Knowledge about risk factors gave prevention practitioners another focus for their efforts. If the conditions associated with substance use could be improved, substance use itself might be stopped. Targeting this broad range of conditions identified by the research, prevention practitioners developed programs aimed at reducing risk in the community, in schools, in families, and among peers. Research has shown that when risks in a child's life are reduced, the child is less vulnerable to substance use and related social and health problems as he or she matures (Hawkins, Lishner, Jenson, and Catalano, 1987).

Risk factor research substantially influenced the ways in which prevention funding organizations, program designers, and service deliverers thought about their program activities and objectives. Parenting programs, community-wide prevention coalitions, and programs aimed at transforming schools as communities (Battistich, Schaps, Watson, and Solomon, 1996) all were added to educational and informational efforts as strategies to prevent substance use. However, the "risk" literature is not always a comfortable fit with the orientation of prevention workers, who want to improve the lives of youth and strengthen their communities. Some prevention researchers have dubbed the risk paradigm a "damage model" (Wolin and Wolin, 1995) that focuses on negative influences on youth. Research on protective factors has emerged to focus, alternatively, on "what is positive and healthy in young people" (CSAP, 1999, p. 3).

While researchers have argued that protective factors are not simply a mirror image of risk factors, the distinction is not clearly drawn (Newcomb and Felix-Ortiz, 1992). A recent CSAP (1999) review notes that "the literature on protective factors and resilience is more diffuse than that for risk factors, and there is less clarity about which factors are most important in the prevention of substance use" (p. 7). What is clear about protective factors is that they represent the influences, orientations, and behaviors in youth's lives that contribute to positive development and help prevent negative behaviors and outcomes such as substance use. Researchers and program designers have identified and promoted protective factors to balance or counter risks in the full range of environmental and personal domains.

Protective factors represent the influences, orientations, and behaviors in youth's lives that contribute to positive development and help prevent negative behaviors and outcomes such as substance use.

When thinking about the design and implementation of prevention programs, it is useful to categorize risk and protective factors into two groups:

- Those external to youth in their "social ecology" (Hawkins and Weiss, 1985).
- Those internal to youth in the way that they process, interpret, and respond to their environment.

Program activities designed to reduce risk or promote protection in the external environments of community, school, and family are very different from prevention strategies that work directly with youth to develop internal protective factors. Therefore, the programmatic implications of changing external risk and protection are very different from those for working on the development of internal factors in young people.

The importance of external and internal risk and protection for the development of effective prevention interventions depends on the interrelationships of these factors and on their association with substance use. The diverse Cross-Site Evaluation sample of high-risk youth presents an exceptional opportunity to assess the ways in which risk and protection factors change with maturation, interact, and relate to substance use. The Cross-Site Evaluation measured specific dimensions of external and of internal risk and protection. Although not exhaustive of the many factors that have been proposed in the literature, the Cross-Site measures include important factors frequently targeted in prevention strategies.

The diverse Cross-Site Evaluation sample of high-risk youth represents an exceptional opportunity to assess the ways in which risk and protection factors change with maturation, interact, and relate to substance use.

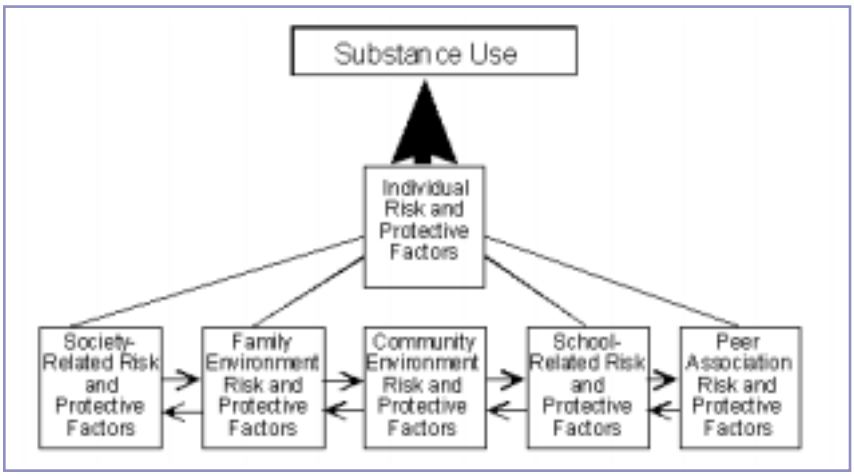
The study also used a set of substance use norm variables. These focus on the attitudes and behaviors—specifically related to the use of alcohol, tobacco, and marijuana—of significant reference groups in the lives of youth. Past research has shown strong relationships between self-reported substance use and these normative contexts. Ability to assess the relationship of these social norm contexts to general risk and protective factors with known correlations to many youth behaviors is another benefit of this study.

All of the measures presented in this report are from the CSAP National Youth Survey completed by both participant and comparison group youth themselves. Self-report measures are consistent with a model of influence in which the individual youth remains at the core. All external influences are "processed, interpreted, and responded to based upon those characteristics that the individual brings to the situation" (CSAP, 1999, p. 2).

The "Web of Influence"

To summarize and order the existing research findings and program assumptions about risk and protection, CSAP developed a framework representing the "web of influence" through which risk and protection shape substance use (CSAP, 1999). As Figure 3 shows, this framework groups external influences on youth into five areas (domains): family, peers, school, community, and society.

Figure 3
The "Web of Influence" on Substance Use



The external risk and protective factors and substance use norms identified earlier in this report (and measured by the self-reported National Youth Survey) can be placed within these five domains. The internal risk and protective factors identified earlier shape each individual's response to the external factors. Protective internal factors may strengthen protective external influences, or they may help youth resist the external influences that increase risk for substance use. The reverse is also true: internal risk factors may heighten the effect of external influences that increase risk or may blunt even protective external factors. In the National Cross-Site measurement of risk and protection, substance use norms are individual risk and protection factors that represent the youth's perception of the substance use expectations and behaviors of significant others in her or his life.

The framework raises important questions about the ways in which external influences and internal orientations interact to prevent or promote substance use among young people.

Because it organizes the risk and protection influences identified by a wide range of research, programs, and approaches, this framework can be applied broadly in developing prevention strategies. The "web of influence" framework raises important questions about the ways in which external influences and internal orientations interact to prevent or promote substance use among young people. It leads the prevention professional to ask just how, and why, specific individual orientations and behaviors may strengthen or weaken the influence that external circumstances have on substance use by youth. The framework also orients inquiry to the ways in which different external domains of influence may interact to influence risk and protection. The framework focuses on the dynamic complexity of youth development in a social environment. In summary, the value of this framework lies in its service as an orienting structure and as an organizer of a diverse body of knowledge. Because of the size and diversity of its youth sample and its breadth of measurement, the Cross-Site Evaluation provides a unique opportunity to begin to answer the question posed by the framework. It offers a rich vehicle for exploring and specifying some of the dynamics that operate between external influences and the internal characteristics of individual youth to determine substance use outcomes. This report responds to this opportunity by describing the age trajectories of risk, protection, and substance use by young people at high risk; by assessing the degree to which individual risk and protective factors are associated with substance use; and by modeling the complex interactions of the most important risk and protective factors and substance use.

External Risk and Protection

Risk and protection research indicates that the risk for substance use during adolescence is strongly related to identifiable characteristics of the environment in which adolescents live. The family management practices of parents or family caregivers, the opportunities and policies of the school environment, and the quality of life and opportunities for participation that characterize the community all influence the development of positive or problem behaviors in youth. The National Youth Survey designed for the Cross-Site Evaluation asked youth respondents about their perceptions of their family, school, and community and defined these measures as follows:

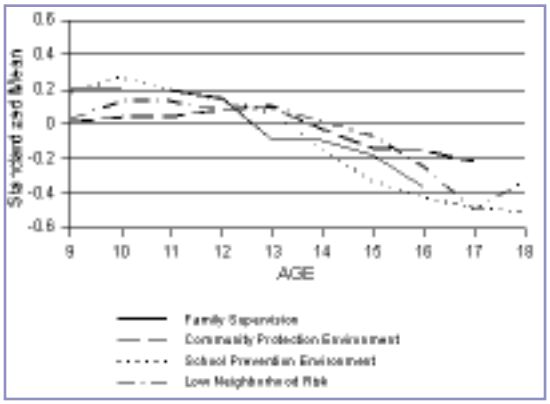
- *Family supervision* indicates the respondent's perceptions of the degree to which parents or caregivers set and monitor rules about the youth's behavior and are concerned about and aware of the youth's friends and activities.
- *School prevention environment* indicates the respondent's perceptions of the degree to which the classroom environment conveys prevention messages about substance use and positive personal development.
- *Community protection environment* indicates the degree to which the respondent participates in organized opportunities for positive activity in the community, including clubs, athletics, and learning opportunities.
- *Neighborhood risk* indicates the respondent's perceptions of neighborhood disorganization, including public substance use and crimes against persons and property.

The challenge for prevention professionals is to make these environments more protective and less characterized by risk, to help youth connect more effectively with protective influences, and to help youth resist the negative influences of environmental components characterized by risk.

The risk and protection framework suggests that more protection in each of these elements of a youth's environment will increase the opportunities for positive development and outcomes and reduce the chances of negative outcomes. The challenge for prevention professionals is to make these environments more protective and less characterized by risk, to help youth connect more effectively with protective influences, and to help youth resist the negative influences of environmental components characterized by risk.

Strategies for helping youth successfully negotiate environmental influences must be appropriate to the changing relationship between young people and their environments as they mature. Figure 4 displays the responses of sample youth, aged 9 to 18, to the external risk and protection measures. Responses are baseline measures taken when the youth entered the study.

Figure 4
Distribution of Youths' Perceptions of External Risk and Protective Factors By Age at Program Entry
(N = 10,473)



As youth age, their perceptions of the level of risk or protection offered by external circumstances shift considerably. For each of the four external risk and protection measures, the perceived level of protection decreases with age, most markedly after the age of 12. The decline in perceived protection with age is greatest for school prevention environment and family supervision. This pattern is partly expected and normal. As youth mature and become more autonomous, the character of family supervision and involvement changes to allow youth more responsibility in their daily lives. The pattern for school indicates that the school environment has fewer opportunities for promoting positive choices and development as youth move through middle school into the high school years. The pattern of decline is less dramatic with respect to the community and neighborhood measures, indicating a more moderate change in youth involvement in positive community activities, or in their perception of social disorganization in their neighborhood, as they age. The relative stability of involvement in positive community activities indicates potential for community-based prevention activities to influence youth. As youth age and become more independent of home, they form associations in the community. The challenge to prevention is to help make these associations positive ones.

Internal Risk and Protection

Not only have prevention practitioners incorporated awareness of external risk into their program strategies through family, school, and community interventions, they have contributed significantly to the understanding of internal risk and protection as well. The predispositions of youth, whether they express them as attitudes, in orientations to behavior, or in actual behavior, filter how they experience their external environment. Prevention researchers and practitioners have been particularly interested in internal factors because they often find they cannot directly influence environmental factors beyond their program scope and resources. This makes identifying personal protective factors that will help youth resist negative environmental influences—and that prevention practitioners can help youth develop—a high priority.

Although researchers do not agree on what makes a youth resilient, they often cite belief in one's ability to produce a meaningful and worthwhile future as a component.

Protection is not simply the absence or the opposite of risk factors, researchers and prevention practitioners have pointed out (Newcomb and Felix-Ortiz, 1992). Indeed, many young people thrive and experience positive development in environments of high risk. These youth, whose internal protective characteristics overcome the influence of external risk, have been termed "resilient" (Wolin and Wolin, 1993). Exploring and defining what makes a youth resilient has become a major prevention theme, especially for practitioners who want to help young people cope with high-risk environments they cannot control. Although researchers do not agree on what makes a youth resilient, they often cite belief in one's ability to produce a meaningful and worthwhile future as a component.

Developing a sense of connectedness to meaningful segments of the environment that provide and support positive opportunities is an important aspect of the internal protective orientation of young people in high-risk environments.

Some resiliency researchers emphasize the importance of attachments to positive social influences, such as a caring and trusted adult (Benard, 1991). The influence of these attachments, sometimes called "bonding" or "connectedness," is an emerging focus in the prevention literature. Most often, this bonding is seen as an individual (internal) attribute, the young person's belief that this external connection is important and meaningful to him or her. Bonded youth feel a stake in the external environment. They believe that interacting and accomplishing in that environment are worthwhile and contribute to a positive future. Thus, developing a sense of connectedness (Resnick et al., 1997) to meaningful segments of the environment that provide and support positive opportunities is an important aspect of the internal protective orientation of young people in high-risk environments.

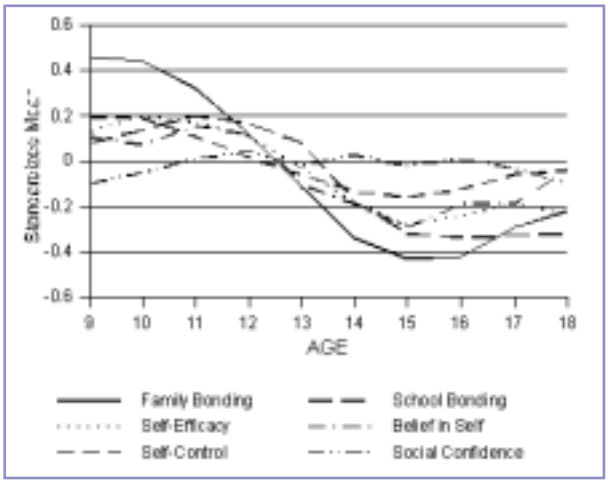
CSAP's National Youth Survey provided self-reported information on the following internal risk and protective factors:

- *Family bonding* measures the degree to which the respondent has a positive orientation to home and parents. The concept includes pride in family, a sense of contribution, and enjoyment of the family environment.
- *School bonding* measures the respondent's orientations toward school as an environment for meaningful connectedness and identifies the degree to which the youth sees school as a place that warrants and rewards effort.
- *Self-efficacy* captures the degree to which the respondent is confident that he or she can tackle meaningful tasks and the degree to which the youth believes his or her efforts will succeed.
- *Belief in self* is a measure of the respondent's optimism or pessimism about the future and feeling about himself or herself.
- *Self-control* is a measure of the degree to which the respondent acts on or controls aggressive impulses.
- *Social confidence* captures the degree to which the respondent believes that he or she gets along well with others, contributes to the social group, is trusted and respected by peers, and makes friends easily.

Like external risk and protection, internal orientations may change as youth mature.

Like external risk and protection, internal orientations may change as youth mature. Figure 5 displays the change in average responses for each of the internal risk and protection factors with age in the baseline sample.

Figure 5
Internal Risk and Protective Factors by Age at Program Entry
(N = 10,473)



Similar to the results for external risk and protection, the responses of younger children are indicative of more protective orientations, including stronger bonding with family and school, stronger perceptions of self-efficacy and self-control, and more belief in self. For this sample, all but one of the protective factors are highest for the youngest age group. The exception is social confidence, which rises slightly from preadolescence to the midteen years. The rest of the orientations drop toward greater risk between the ages of 11 and 15, indicating a reduction in the internal protective orientations during the middle and early high school years.

The change in protective factors with age is particularly dramatic with respect to the indicators of bonding or connectedness. Family bonding changes the most, with a precipitous drop from a positive family orientation at the age of 9 to a less strong feeling that the family is a place for meaningful communication, contribution, or recreation during the midteen years. School bonding shows a similar change. Other orientations, with the exception of social confidence, follow a similar but less pronounced pattern.

Substance Use Norms

The prevention field has clearly recognized the power of social norms—the attitudes and behaviors perceived to prevail in the social environment—as an influence on youth behavior. "Peer influence" is an often-cited reason that youth begin to use substances. Research has established peer attitudes and behaviors as one of the strongest correlates of self-reported substance use (Akers, 1977; Elliot et al., 1982; Ford, 1983; Fors and Rojek, 1983; Foster, 1984; Oetting and Beauvais, 1986). Broader social norms (conveyed in the media and in advertising) and family norms (Newcomb, Huba, and Bentler, 1986) have also been identified as correlates of use, or resistance to use, among youth.

Research has established peer attitudes and behaviors as one of the strongest correlates of self-reported substance use.

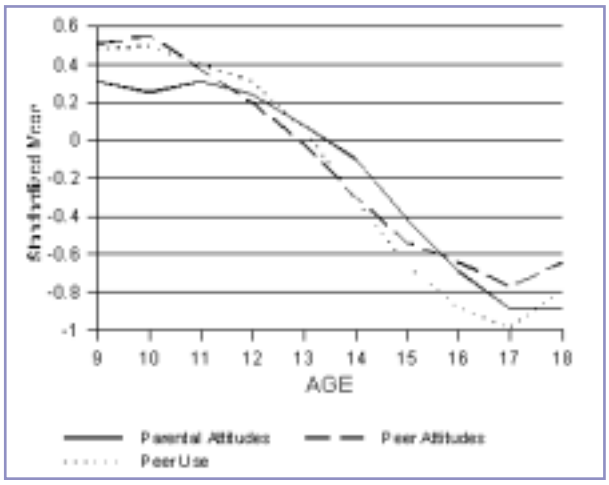
CSAP's National Youth Survey measured several substance use norms in those social contexts that are closest to youth: parents and friends. Youth were asked to report their perceptions of their parents' reactions to substance use, as well as their perceptions of their friends' substance use behaviors and their friends attitudes toward use:

- *Parental attitudes* captures the degree to which the respondent believes his or her parents would be upset if they found out that the youth smoked cigarettes, drank alcohol, or used marijuana sometimes.
- *Peer attitudes* measures the respondent's assessment of the degree to which his or her peers would disapprove if they found out that the respondent smoked cigarettes, drank alcohol, or used marijuana sometimes.
- *Peer use* measures whether the respondent thinks his or her "best friend" smokes cigarettes, drinks alcohol, or uses marijuana sometimes.

As with the other risk and protection domains, youths' perceptions of substance use norms in these significant reference groups change rapidly with age. Figure 6 shows that, within the 5-year age range from 11 to 17, youth perceive substance use norms as moving dramatically from prohibitive to permissive. To underscore this change, 17 percent of the 10-year-olds compared with 73 percent of the 16-year-olds thought their best friend used alcohol sometimes.

In sum, as youth age, they perceive a decline in the protective nature of external factors, internal factors, and substance use norms toward greater risk.

Figure 6
Substance Use Norms by Age at Program Entry
(N = 10,473)



In sum, as youth age, they perceive a decline in the protective nature of external factors, internal factors, and substance use norms toward greater risk. The following section looks at patterns of substance use as youth mature.

Patterns of Substance Use

The CSAP HRY demonstration programs have as their main objective preventing or reducing substance use and its associated problems. Therefore, it is essential to know how many and which youth were using substances when they entered the programs. The self-report survey given to youth at the start of the programs asked respondents about their use of a number of substances within the preceding 30 days[3] and over their lifetime. Table 1 shows prior 30-day substance use rates for the portion of the study sample ages 12 through 17, by age subgroups. It also compares those results with data from the 1998 National Household Survey on Drug Abuse (NHSDA) (SAMHSA/OAS, 1998), a randomly sampled general population survey of persons 12 years of age or older.

Table 1
Comparison of NHSDA and Cross-Site Substance Use for 12- to 17-Year-Old Respondents

	30-Day Cigarette Use		30-Day Alcohol Use		30-Day Marijuana Use	
Age	NHSDA	Cross-Site	NHSDA	Cross-Site	NHSDA	Cross-Site
12-13	8.0%	9.6%	4.9%	11.3%	1.7%	5.8%
14-15	18.2%	32.8%	20.9%	31.2%	8.8%	27.0%
16-17	29.3%	51.4%	32.0%	46.4%	14.7%	46.7%

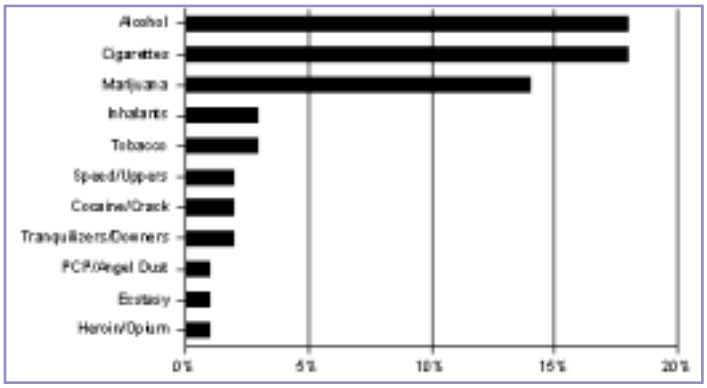
NOTE. National Household Survey on Drug Abuse (NHSDA) sample size for 12- to 17-year-olds (n = 6,778); Cross-Site sample size for 12- to 17-year-olds (n = 7,245).

Youth in the Cross-Site sample reported higher use rates for all substances in all age groups than did youth in the NHSDA general population sample. Also, the use rates among high-risk youth increased more rapidly with age, a pattern that is particularly emphatic for marijuana. The comparison confirms that the Cross-Site programs serve youth in a higher-risk population than young people in the general population.

The Cross-Site programs serve youth in a higher-risk population than young people in the general population.

Looking specifically at the percentage of youth in the Cross-Site sample reporting use of any one substance during the previous 30 days, the rate of use is low (Figure 7). The most frequently reported substances used are alcohol (18%), cigarettes (18%), and marijuana (14%). Relatively few youth reported recent use of drugs such as cocaine or crack, speed, tranquilizers, PCP, and heroin. This pattern suggests that the program sites recruited youth who were usually not regularly involved in substance use and were, therefore, appropriate participants in prevention or early intervention programs.

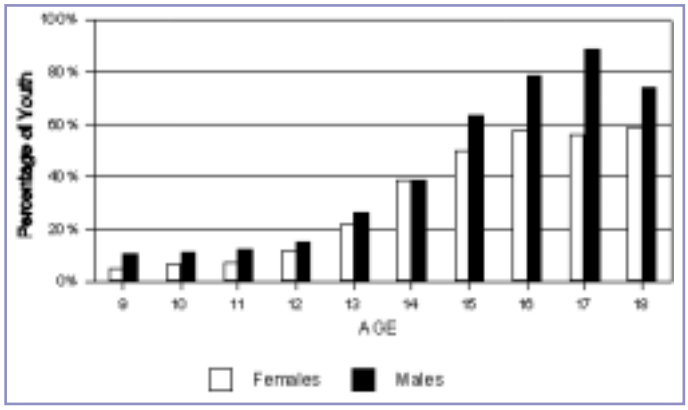
Figure 7
Self-Reported 30-Day Substance Use at Baseline: Percentage of Study Sample
(N = 10,473)



[3] Youth were asked: "How many days in the last 30 days did you smoke a cigarette/have a drink of alcohol/use marijuana?" Responses ranged from 0 to 5 (six response categories). Possible responses included (0) none, (1) 1 or 2, (2) 3 to 5, (3) 6 to 9, (4) 10 to 19, and (5) 20 to 31.

To profile the sample, a composite measure of "30-day substance use" was constructed. This composite measure includes the use of any one of three substances—tobacco, alcohol, or marijuana—within the past 30 days. Figure 8 displays the percentage of youth who reported substance use by age and gender using this composite measure of 30-day use.

Figure 8
Self-Reported 30-Day Substance Use at Baseline by Age and Gender
(N = 10,473)



The use rates for younger children remain low until around age 13 and then rise rapidly until age 16 for females and age 17 for males. Use rates across the age groups are consistently higher among males than females. Substance use among females levels off at age 16 and remains somewhat constant through age 18. Males in the 16- and 17-year-old age groups are mainly from very high-risk sites serving incarcerated males, which accounts for the high use pattern in the age group at program entry. The lower 30-day use rates for 18-year-olds suggests that the older youth who were willing to participate in the study programs were individuals who were not as involved in recent drug use as the younger high-school aged youth.

Use rates across the age groups are consistently higher among males than females.

Summary

The findings on risk, protection, and substance use and the age of youth reveal a consistent pattern. As youth move through the adolescent years, there is a steady movement from the protective to the risk conditions in most of the external and internal factors identified here. That movement is particularly great in family bonding, school bonding, and peer attitudes and use, those factors that refer to the social environments to which youth are building attachments as they mature. The following section explores these risk and protective factors further by explicitly assessing their relation to substance use.

Associations Among Risk and Protection Measures and Substance Use

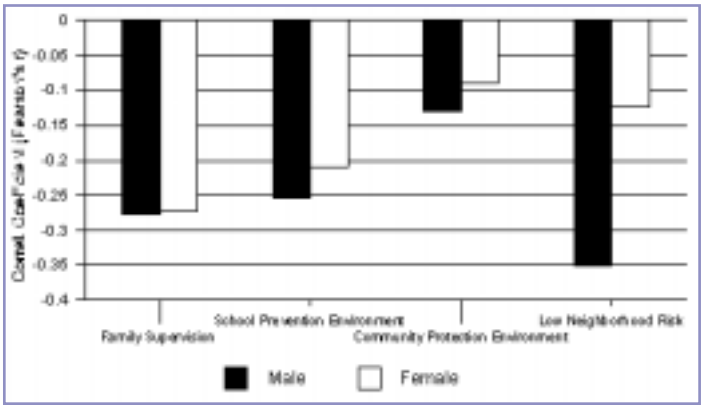
All risk and protection frameworks assume that each youth has a personal "web of influence": a set of risk and protective factors, external and internal, that are related to that youth's use or nonuse of substances. Testing this assumption involves identifying the degree to which a relationship exists between self-reported substance use and the presence of protective influences or internal orientations. These relationships for the entire youth sample and for males and females are examined separately to determine whether there are differences between these groups in use levels, increases in use, or other aspects of substance use related to risk and protective influences.

The analysis of these relationships uses correlation coefficients (Pearson's *r*) to compare relationship strengths, with coefficients of ±1.0 indicating complete association and 0.0 meaning no association. Because of the very large sample size, statistical significance is not a meaningful indicator for this analysis; in fact, all reported correlations are highly significant.[4] The external, internal, and substance use norm domains are analyzed separately. Substance use is measured as combined 30-day substance use of cigarettes, alcohol, or marijuana.

External Risk and Protection

Figure 9 shows the strength of association between each of four external risk and protection factors and self-reported substance use. The four factors were selected from three external domains: one each from the family (family supervision) and school (school prevention environment) domains, and two from the community domain (community protection environment, neighborhood risk). Strength of association is shown separately for males and for females. In the case of protective factors, the degree of the negative association indicates the strength of the factor's protective influence against substance use. In the case of a risk factor, the degree of the negative association indicates the tendency of the factor to make substance use more likely. The larger the negative correlation, the greater the degree of protection against use or risk for use the influence provides.

Figure 9
Bivariate Correlations Between External Risk and Protection Factors and Substance Use, by Gender (N = 10,473)



NOTE. All external risk factors are coded so that higher scores indicate more positive behaviors.

The figure indicates that for this sample of youth, the stronger the external protection, the less substance use youths will experience. For example, in risk-free neighborhoods, youth are less likely to use substances than youth in high-risk neighborhoods. On the other hand, youth with little family supervision are more likely to use substances.

The data suggest that conditions in the neighborhood have a greater influence on substance use in males than in females.

Males and females demonstrate different patterns of association between external influences and substance use. Family supervision influences male and female behaviors similarly, but each of the other external influences is more strongly[5] associated with substance use for males than for females, dramatically so in the case of neighborhood risk. This suggests that conditions in the neighborhoods have a greater influence on substance use in males than in females.

Looking at the sample as a whole, family supervision shows the strongest protective association against substance use. The correlations for school prevention and neighborhood risk indicate moderate protective associations, and the Cross-Site measure of community protection is less correlated with use. Finally, low neighborhood risk is much more negatively associated with substance use among males than females.

4 The statistical significance of an association is determined by the strength of the relationship between the two variables and the number of cases used in the analysis. As the size of a sample increases, weaker relationships become statistically significant.

5 For this analysis, values of 0.0 to -0.19 are considered weak, -0.20 to -0.34 are considered moderate, -0.35 to -0.49 are strong, and -0.50 and above are very strong.

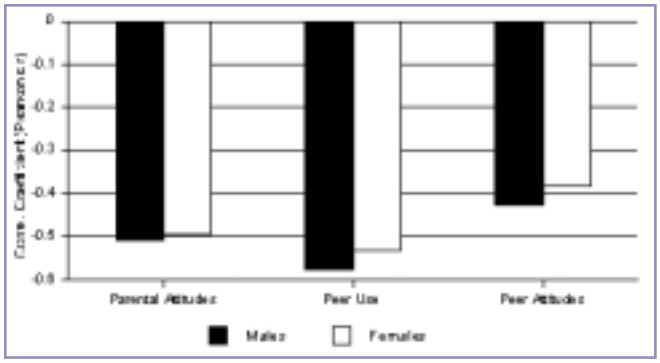
Substance Use Norms

In the "web of influence" framework, the substance use norms including the youths' perception of parental attitudes, peer attitudes, and peer use fall into the external domains of family and peers.[6]

Figure 10 summarizes the patterns of association between these external substance use norm influences and substance use. The results confirm the strong association between substance use by peers and personal use that has consistently been found in research literature. In fact, the association between peer use and personal substance use is the strongest among all the risk and protection factors investigated in this study. Parental attitudes are also very strongly associated with personal use, and peer attitudes are strongly associated. In all cases, these associations are slightly stronger among males than among females, particularly for peer attitudes and peer use.

The association between peer use and personal substance use is the strongest among all the risk and protection factors investigated in this study.

Figure 10
Bivariate Correlations Between Substance Use Norms and Substance Use: Males and Females
(N = 10,473)



Internal Risk and Protection

The patterns of association between internal risk and protection factors and substance use are shown in Figure 11. Of the six internal factors investigated, school bonding and family bonding—two factors that indicate connectedness to social contexts-clearly show the strongest associations with substance use, although the associations are in the "moderate" range. Belief in self, self-control, and self-efficacy are less associated with substance use, and social confidence is very weakly related to substance use.[7]

Figure 11
Bivariate Correlations Between Internal Risk and Protection Factors and Substance Use: Males and Females
(N = 10,473)

6 All risk and protective factors are coded so that a higher value indicates stronger protection. Therefore, negative correlations of parental and peer attitudes and peer use with substance use indicates negative relationships between these factors and substance use.

7 All internal factors are coded so that higher numbers represent greater protection.

The pattern of gender differences for the internal factors is very different from the pattern for both of the external influence categories. The relationships between all the internal risk and protection factors and substance use are substantially stronger for females than for males. This is especially true for family bonding.

The differences in association with substance use among the internal risk and protection factors investigated in this study have implications for understanding the influences of these factors on substance use and for increasing the effectiveness of prevention interventions. This study's findings reinforce the body of existing prevention research on internal factors in several areas:

The relationships between all the internal risk and protection factors and substance use are substantially stronger for females than for males.

- The strength of both school bonding and family bonding as correlates of substance use supports the argument that connectedness to family and to school are the most robust and important protective factors for both the "quietly disturbed behaviors" that are more common in girls, and the "acting out behaviors" more typical of boys (Resnick, Harris, and Blum, 1993). In a summary of protection research, Resnick (1999) notes that "measures of closeness to and connectedness with family and school were the most salient, cross-cutting protective factors."
- The very low level of association between social confidence and substance use suggests that personal confidence in one's ability to relate well socially is not by itself a protective factor. Indeed, detailed analysis of this affective factor indicates that it is positively associated with substance use among the highest-risk youth. This finding is consistent with other research that has questioned measures of personal affect such as self-esteem and other indicators of self-confidence that do not relate confidence to a particular social environment (Hansen, 1997).
- The remaining internal risk and protection factors—self-efficacy, self-control, and belief in self—are only weakly associated with substance use for males and moderately associated for females. Although these self-image measures have some relevance as protective factors, they do not include the connectedness dimension that appears important in this analysis and others.

Associations with Use: A Summary

The findings from the Cross-Site Evaluation confirm the premises of CSAP's "web of influence" and support use of the risk and protection framework as a foundation for prevention programming. Risk and protection factors across the internal and external domains correlate with substance use by youth. Furthermore, the results are consistent with findings from less comprehensive studies. Youth perceptions of peer norms are very strongly associated with use, and parental norm setting is strongly associated with use. School bonding, school prevention environment, family connectedness, and family supervision are moderately related to substance use. The consistent pattern across domains is that male substance use behavior is shaped more by the external environment than female behavior, whereas female substance use behavior is more sensitive to internal influences. Most important, the findings concerning internal risk and protection highlight the importance of the school and family connectedness orientations. These findings suggest that internal risk and protection is not primarily an "inoculation" against external influences, but a catalyst and facilitator for building connectedness with positive external environments.

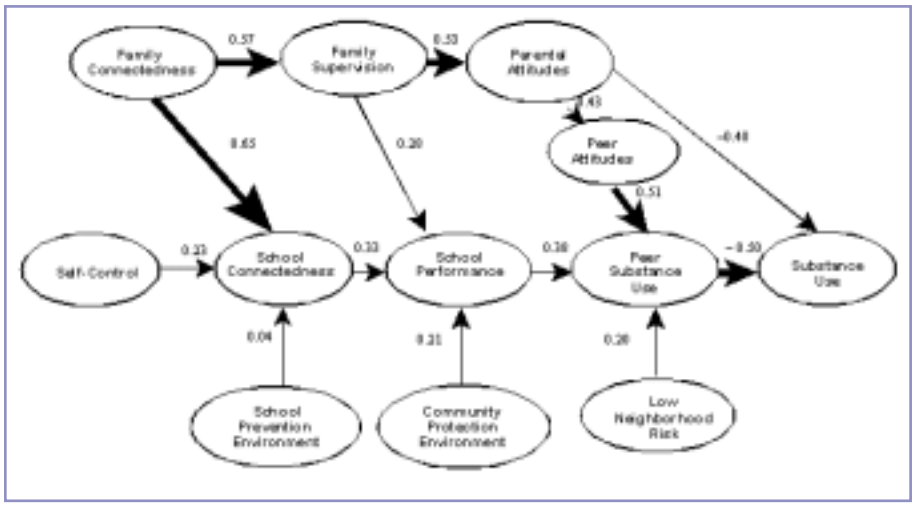
Internal risk and protection is not primarily an "inoculation" against external influences, but a catalyst and facilitator for building connectedness with positive external environments.

Pathways of Influence Among Risk and Protective Factors and Substance Use

The findings in the previous section provide insights into the structure of the relationships among individual risk and protective factors within the domains that are part of the "web of influence." However, the findings do not reflect the *interrelationships* among the domains themselves, which are depicted by the arrows and lines in Figure 12.

To investigate more specifically the relationships suggested in the "web of influence," a modeling technique[8] was used to describe what can be called "pathways of influence" among the risk and protective factors and substance use. This technique does not test cause-and-effect relationships, but it does indicate whether such relationships are plausible. Figure 12 shows the model, which is based on data from the full (both participant and comparison youth) study sample.[9]

Figure 12
Structural Equation Model for Risk and Protection Factors and Substance Use Among High-Risk Youth
(N = 10,473)



Summary Statistics

CFI = 0.90 RMSEA = 0.03 NNFI = 0.90
NOTE. Negative correlations between parental attitudes and peer substance use with personal substance use result because all measures with the exception of substance use are coded so that higher numbers represent more positive behaviors. Widest lines indicate correlations of 0.50 or more, medium-width lines are correlations ranging from 0.20 to 0.49, thin lines are correlations of less than 0.20.

The model includes the array of risk and protection factors and substance use norms explained in the previous section, reflecting a comprehensive application of the CSAP framework. The number next to each arrow indicates the strength of the relationship the arrow represents (i.e., the relationship between one factor and another).[10] The model fits the data well (CFI = 0.90, RMSEA = 0.03, NNFI = 0.90),[11] meeting the high standard for good model fit in these kinds of analyses.

8 Structural equation modeling was conducted using LISREL (Joreskog and Sorbom, 1999).

9 Multigroup analyses contrasting treatment and comparison youth demonstrated no substantial differences in model fit or path coefficients, justifying use of the combined sample of youth at high risk.

10 The width of each arrow shaft indicates the strength of the association between the individual protective factor and substance use; i.e., the degree to which higher protection on the factor relates to less use. Wider arrows shafts are indicative of stronger relationships.

11 The Comparative Fit Index (CFI) statistic measures the goodness of fit. Models with indices of 0.90 or more are considered to be strong-fitting models.

Modeling Decisions

To produce a lean model and improve statistical fit, the number of factors included in the model was reduced analytically. The following decisions were made during model building:

- **Internal Risk and Protective Factors.** The number of internal factors was reduced to three: school connectedness, family connectedness, and self-control. School connectedness and family connectedness are newly constructed latent variables that emerged from the modeling process. They emphasize the importance of connectedness by expanding the bonding measures to include closely related items that convey the meaningful returns of connectedness in the lives of the youth.[12] The reduction was based on the connectedness concept and on confirmatory factor analysis. Each of these factors is described below:

  School connectedness is composed of the school bonding and self-efficacy items, forming a single measure that represents the importance of the school as a forum in which youth can realize self-efficacy. This variable suggests that meaningful connectedness to school is associated with youth's realizing the ability to achieve.

  Family connectedness is a latent variable that combines the original family bonding measure with a family communication measure. The new measure represents the importance of family as a forum for safe and supportive communication during the developmental years.

  Self-control is maintained in its original form because it consistently emerges as a factor with a moderate-strength relationship to substance use and because it did not combine with other dimensions in latent variable modeling.

- **External Risk and Protective Factors.** The model includes external factors from the family, peer, school, and community domains to aid understanding of how these domains interrelate in their influence on substance use. Two school-related factors require explanation. School prevention environment was included in the model because of the importance of school-based programs in current prevention strategies. School performance, a factor combining self-reported measures of grades in school and school attendance, was added to the model as a latent variable. It mediates between school connectedness and peer substance use.

- **Substance Use Norm Measures.** In the model, substance use norm measures serve as intermediaries through which other influences pass. The positioning of the peer norm measures (peer attitudes, peer substance use) implies that the creation of friendship groups is an important consequence of various external and internal factors. Youth are involved in positive peer groups because their families and schools have stressed the importance of developing positive relationships with peers. The positioning of the parent norm measure (parental attitudes) implies that family connectedness and family supervision create an environment in which parents' messages carry weight. These norms were placed close to one another in the model because of their very strong correlation with substance use, as well as findings reported in the prevention literature.

The model is consistent with and elaborates on prior prevention research using a social ecology approach. Hawkins and Weis (1985) showed that peer influences did not entirely explain the phenomenon of substance use and that external factors played a vital role in shaping the resiliency of youth and their ability to resist substance use. Kumpfer and Turner (1991) later supported and expanded on this work in studies of youth living in Utah.

[12] Confirmatory factor analysis was conducted on all latent variables; all model fits exceeded 0.90.

Interpreting the Model

The model in Figure 12 shows one possible explanation for the way risk and protection factors from different domains in the "web of influence" interact in their connection with substance use.

- Family connectedness is a key to the substantial path of family influence on substance use shown in the model. When family bonding is high, family supervision and parental attitudes exert strong influences on peer associations and substance use. When family bonding is high and family supervision is high, parental attitudes carry particular weight. The substantial direct negative effect (coefficient = -0.40) on substance use indicates that parental attitudes matter in the bonded family even when those attitudes are at odds with peer attitudes and behaviors.
- School connectedness is a crucial link in the internal risk and protection path. Family connectedness and self-control contribute to school connectedness, which relates to school performance, peer substance use, and ultimately personal substance use. The measure of school performance (self-reported grades and attendance) provides an important link in this path. Apparently school success enhances the association that school connectedness has with nonusing peers and reduced personal substance use.
- In the community domain, neighborhood risk is associated with peer substance use as an influence on personal use, reflecting the importance of social environment in shaping youth behaviors.

Based on the model, it is possible to form broader conclusions about the dynamics of the "web of influence." The model clearly supports the interactive nature of protective influences—internal, external, and normative—against substance use.

- *Connectedness protects against substance use.* Positive behavioral outcomes among youth reflect a tight interweaving of external and internal protective factors. Connectedness to family and to school forms the core of this protection. Meaningful involvement is key to connectedness. When the external environments of family and school offer youth involvement that is challenging, provides recognition, and is rewarding, these environments serve as powerful protective factors against substance use.
- *The peer environment is critically linked to substance use.* Youth whose peers do not use substances tend not to use substances themselves. Youth whose peers disapprove of substance use also report less use of substances. Because peer relationships are strongly associated with the family, school, and community environments in which youth reside, positive changes in those external environments can affect the peer environment and impact individual substance use.
- *Broadening the range of protective influences in youth's external environment increases protection against substance use.* The 48 programs in the Cross-Site Evaluation focused on strengthening youth's internal protective factors and on increasing community protection activities. The importance of family bonding and school connectedness in the model indicates that broadening the program focus could increase program effectiveness. Efforts to strengthen families (by encouraging communication, appropriate supervision, and positive norm setting) and to strengthen schools as caring communities (to improve school bonding) should increase youth protection against substance use.

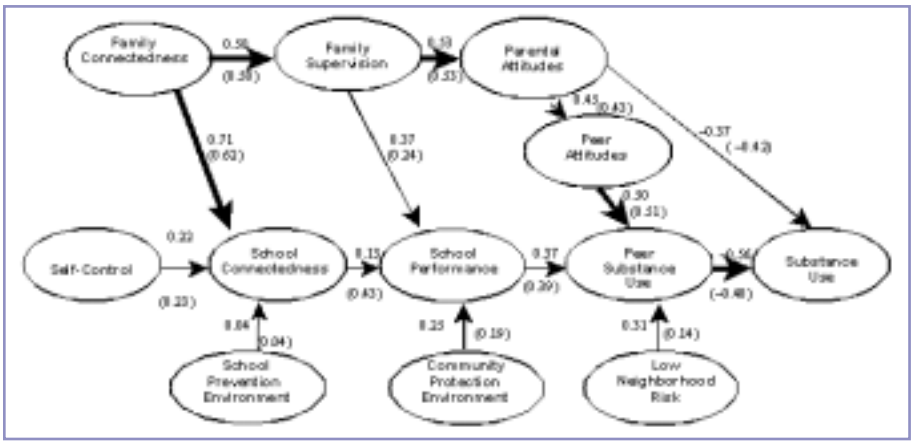
Pathways of Influence for Subgroups of Youth at Risk

The model shown earlier (see Figure 12) depicts pathways of influence for all the youth in the Cross-Site study sample. Prevention practitioners may question whether the dynamics of risk and protection presented in the model apply equally to subgroups of youth at risk. To answer that question, the study sample was analyzed by gender, age, and ethnicity.

Gender Group Differences

The model shown in Figure 13 is partitioned by gender. (Coefficients in parentheses are for females.) There is a strong fit for both males and females with minimal differences, and the overall statistical fit of the model is good (CFI = 0.90). All of the hypothesized paths hold for both gender groups.

Figure 13
Structural Equation Model for Gender Groups
(Males, N = 3,596; Females, N = 6,941)



Summary Statistics

CFI = 0.90 RMSEA = 0.03 NNFI = 0.90

NOTE. Coefficients in parentheses are for females. Widest lines indicate correlations of 0.50 of more, medium-width lines are correlations ranging from 0.20 to 0.49, thin lines are correlations of less than 0.20.

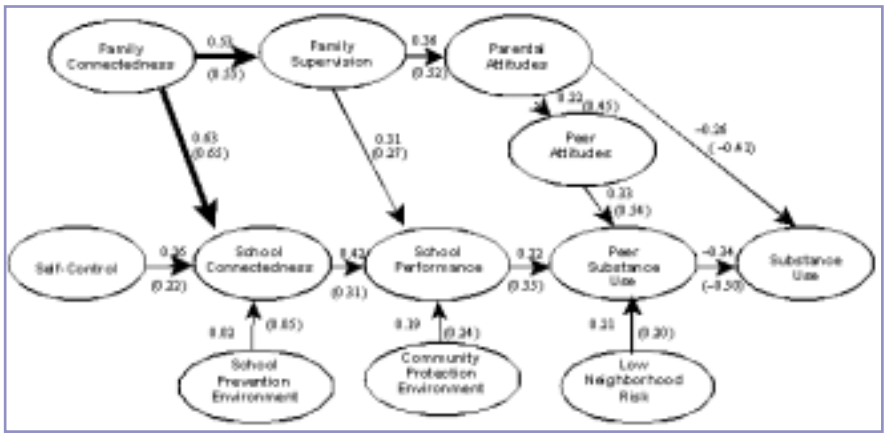
Some interesting implications emerge from the few gender differences shown in the model. School connectedness is a stronger predictor of reported school performance (grades and school attendance) for females than for males, suggesting that school provides a more relevant forum of connectedness for females than for males. Parental attitudes toward substance use are slightly more strongly related to personal use for females (-0.42) than for males (-0.37). Both paths from neighborhood risk to peer substance use to the subject's own substance use are slightly stronger for males (0.31 and -0.56) than females (14 and -0.48). These differences are minor within the overall similarity of the paths to substance use for both genders.

School connectedness is a stronger predictor of reported school performance for females than for males.

Age Group Differences

Partitioning the model by age reveals some important differences, as shown in Figure 14. (Coefficients in parentheses are for the older youth.) The model is strong for both younger (9- to 11-year-old) and older (12- to 17-year-old) youth.

Figure 14
Structural Equation Model for Age Groups
(Younger, N = 2,879; Older, N = 7,566)



Summary Statistics
CFI = 0.90 RMSEA = 0.025 NNFI = 0.90
NOTE. Coefficients in parentheses are for the 12- to 17-year-old youth. Widest lines indicate correlations of 0.50 or more, medium-width lines are correlations ranging from 0.20 to 0.49, thin lines are correlations of less than 0.20.

Several major age-related differences emerge in the model. The first is the importance of family factors for older youth. Family supervision and parental attitudes are stronger predictors of substance use behavior in youth age 12 years and older than they are for preteens. Some of this difference may be attributed to reduced variation in the younger group, where positive orientation toward family is higher in general. Nevertheless, the data indicate that family continues to play a critical protective role as youth develop through adolescence—despite the fact that teens report a decline in family supervision and family connectedness as they grow older (see Figures 4 and 5). Second, peers influence older youth more than younger youth. Peer attitudes and perceptions of peer use are stronger predictors of substance use among older youth than they are for those younger than 12. This reflects the developing sensitivity to social perceptions that begins in early adolescence and continues into adulthood.

Third, the path from school connectedness to school performance is stronger for younger youth than for the older group. This suggests that school plays a critical role in influencing negative behaviors that may lead to substance use among younger youth.

Fourth, school performance is a stronger predictor of substance use behavior in older youth than in younger youth. For students older than 12, the model suggests that poor grades are associated with substance-using peers and personal substance use.

School performance is a stronger predictor of substance use behavior among older youth than in younger youth.

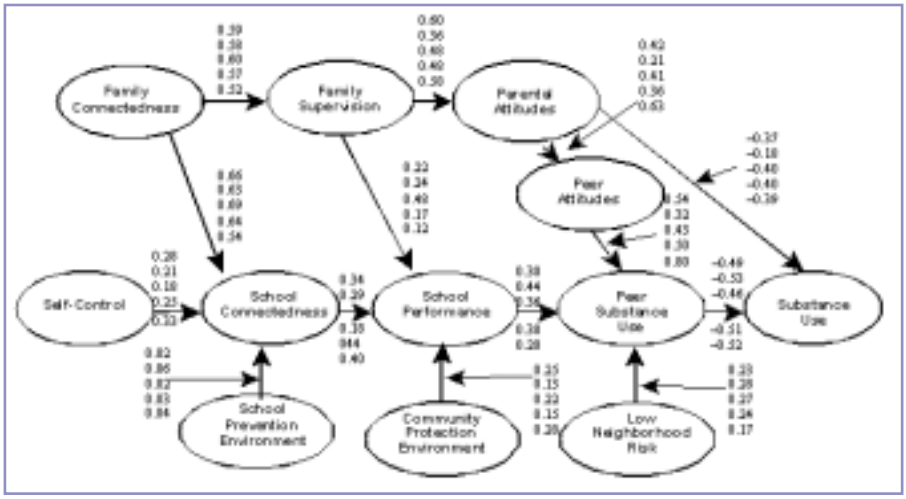
Ethnic Group Differences

Figure 15 shows the model partitioned by ethnicity. Multiple-group structural modeling indicates that all the paths hypothesized in the model hold for all ethnic groups. Differences between the groups for most paths are typically small and idiosyncratic. A few of these differences do suggest particular areas of concern about risk and protection for specific racial and ethnic groups. For example, school performance among African-American youth is more strongly associated with family supervision and less strongly associated with the youth's own school connectedness than for youth in other racial/ethnic groups. For Hispanic youth, the opposite pattern is present. Overall, however, the model has a high degree of consistency across the major ethnic groups and cultures of America.

The model has a high degree of consistency across the major ethnic groups and cultures of America.

Family continues to play a critical protective role as youth develop through adolescence. Parental attitudes, peer attitudes, and perceptions of peer use are stronger predictors of substance use among older youth than they are for those younger than 12.

Figure 15
Structural Equation Model for Racial/Ethnic Groups
(N = 10,473)



NOTE. Coefficients are listed from top to bottom in the following order:

Native American (n = 1313) Asian/Pacific Islander (n = 1164) African American (n = 3722)
Hispanic (n = 2742) Non-Hispanic/White (n =1212)

Model Summary

In summary, the model of risk and protection factors for substance use among high-risk youth is robust. It is based on a large sample of at-risk youth, and it applies to females and males, younger and older youth, and across ethnic groups. The model emphasizes the critical importance of family, peers, and individual protective factors for buffering youth from substance use. More importantly, it suggests the interdependence of these domains. The key to prevention is not to make youth insensitive to their social environment, but to ensure that they are strongly connected to positive, healthy environments. Given the stability of the model across these important population subgroups, practitioners can use it to address important questions about which risk and protective factors prevention programs should be targeting. By reducing to a manageable number the important predictors of substance use, the model should help practitioners focus their resources efficiently to improve program outcomes.

Conclusion and Discussion

The National Cross-Site Evaluation of High-Risk Youth Programs has created an excellent opportunity to expand knowledge about risk and protective factors and substance use among youth at high risk. The diversity in the sample allowed analyses of patterns in risk and protective factors and substance use as youth mature through the adolescent years, across genders, and across racial and ethnic groupings. These analyses produced important findings with profound implications for prevention policy and program design.

- With respect to age, the analysis revealed a consistent pattern of increased risk, in both external circumstances and internal orientations and perceptions, between the ages of 12 and 16. Substance use escalated sharply during these years as well, suggesting an association of increased risk with increased use.
- While all of the external, internal, and perceived norms measures moved in the direction of increased risk during the adolescent years, there were some differences in the rate of change. In other words, risk increased more in some areas than others.

  In particular, measures associated with youth's connectedness to family and school decreased particularly steeply among internal factors. Youth's perceptions of parental and peer disapproval of substance use also declined sharply during these years. On the other hand, youth's social confidence decreased much less. Among these youth at risk, it was not their belief that they could establish social ties that changed dramatically, it was their perception of the focal point of those ties. In particular, the importance of family and school as a source of meaningful ties decreased.
- Analysis of the association of each risk and protective dimension with self-reported substance use confirms the relative importance of those variables related to connectedness. Among the internal risk and protective factors, family and school bonding are most strongly associated with use. Youth who are more bonded with family and school report less use.
- The association between risk and protection and substance use highlights differences between males and females. Specifically, the association of external factors, particularly neighborhood risk, and substance use is stronger for males. The association of internal factors and personal substance use is stronger for females.

Finally, structural modeling brings additional coherence and focus to the ways in which risk, protective, and normative factors may influence substance use among youth. The analyses produced a robust model of adolescent substance use and its correlates among high-risk youth populations. The relationships displayed in this model substantiate prior findings on the relationships among risk and protective factor measures and substance use. The model also expands on this research by showing the indirect and direct relationships among individual, family, peer, school, and community factors. The model is relatively stable across age, gender, and ethnic groups. There is some evidence that family influences are more important for females than males and that neighborhood risk influences are stronger for males.

By specifying plausible pathways within and between external, internal, and normative risk factors and substance use, the model adds detail to understanding of the "web of influence" on adolescent substance use.

- **Internal Risk and Protection**. The analyses have important implications for research on internal protective factors among youth at risk. The previous literature on internal risk and protection has proposed numerous attitudes, orientations, and personal competencies as critical factors in youth's use of substances. The result has been confusion. This analysis suggests a much simpler structure of important issues. Factors that build connectedness with positive external environments (e.g., family connectedness and school bonding) are critical deterrents to adolescent substance use.
- **Family**. The model reinforces much of the research regarding the importance of family in preventing or reducing adolescent substance use. Among females and older youth, family supervision and parental attitudes appear to be particularly important.

- **School**. The analyses point to the importance of school in changing substance use patterns. Both school connectedness and school performance show strong associations with individual substance use. School can be an important forum for changing patterns of use.
- **Peer**. The findings from this study substantiate prior research showing that association with peers who use tobacco, alcohol, or marijuana is highly related to individual substance use. The relationship between peer effects and individual substance use is the strongest among the latent variables in the model. This finding is supported among males and females, as well as older and younger youth. Peer effects also serve as a powerful mediator between internal, family, and community factors and individual substance use.

Successful and fulfilling interaction with a positive social environment is a key to positive development. The model places connectedness with the social settings of family and school at the core of prevention programming.

Finally, by highlighting the importance of the family and the school, the model suggests that youth develop important personal competencies (such as cooperativeness, a positive view of the future, a belief in self, and a feeling of personal efficacy) through positive orientations to, and interactions with, the social settings that are central to our society. Successful and fulfilling interaction with a positive social environment is a key to positive development. Thus the model places "connectedness" with the social settings of family and school at the core of prevention programming.

All of this has direct implications for prevention policy and practice. The trends in risk, protection, and use confirm the critical status of the middle school years as a period of experimentation and initiation of substance use, as well as a critical transition in the social bonds that youth form. The data also indicate that programs serving youth at risk in middle school must reach some youth who have already initiated use. These are important years for prevention.

The overall findings also confirm the importance of comprehensive prevention that addresses the range of environmental factors as well as the individual orientations and behaviors of the youth themselves. Community, family, school, and peer circumstances clearly condition substance use. For schools, youth's connection and performance are the central issue with respect to preventing substance use. The school is the major forum for accomplishment and recognition in youth at these ages. Those who are connected with that environment use cigarettes, alcohol, and marijuana less.

The central implication for prevention is the need to build connections to positive and meaningful social environments for youth. Though important, just changing the environment, or just changing individual orientations, is not enough. Protection and positive development requires connection between the two. Building and supporting these connections is a central challenge to prevention and a positive promise to youth.

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